Complete Summary

GUIDELINE TITLE

Advances in neuropathic pain: diagnosis, mechanisms, and treatment recommendations.

BIBLIOGRAPHIC SOURCE(S)

Dworkin RH, Backonja M, Rowbotham MC, Allen RR, Argoff CR, Bennett GJ, Bushnell MC, Farrar JT, Galer BS, Haythornthwaite JA, Hewitt DJ, Loeser JD, Max MB, Saltarelli M, Schmader KE, Stein C, Thompson D, Turk DC, Wallace MS, Watkins LR, Weinstein SM. Advances in neuropathic pain: diagnosis, mechanisms, and treatment recommendations. Arch Neurol 2003 Nov;60(11):1524-34. [70 references] PubMed

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
CONTRAINDICATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY

SCOPE

DISEASE/CONDITION(S)

Neuropathic pain including:

- Peripheral neuropathic pain
  - Acute and chronic inflammatory demyelinating polyradiculoneuropathy
  - Alcoholic polyneuropathy
  - Chemotherapy-induced polyneuropathy
  - Complex regional pain syndrome
  - Entrapment neuropathies (e.g., carpal tunnel syndrome)
  - Human immunodeficiency virus (HIV) sensory neuropathy
  - Iatrogenic neuralgias (e.g., postmastectomy pain or postthoracotomy pain)
  - Idiopathic sensory neuropathy
  - Nerve compression or infiltration by tumor
  - Nutritional deficiency-related neuropathies

    - Painful diabetic neuropathy
    - Phantom limb pain
    - Post-herpetic neuralgia
    - Postradiation plexopathy
    - Radiculopathy (cervical, thoracic, or lumbosacral)
    - Toxic exposure-related neuropathies
    - Tic douloureux (trigeminal neuralgia)
    - Posttraumatic neuralgias
- Central neuropathic pain
    - Compressive myelopathy from spinal stenosis
    - HIV myelopathy
    - Multiple sclerosis-related pain
    - Parkinson disease-related pain
    - Postischemic myelopathy
    - Postradiation myelopathy
    - Poststroke pain
    - Posttraumatic spinal cord injury pain
    - Syringomyelia

GUIDELINE CATEGORY

Management
Treatment

CLINICAL SPECIALTY

Anesthesiology
Family Practice
Geriatrics
Internal Medicine
Neurology
Oncology
Pharmacology
Psychiatry
Psychology

INTENDED USERS

Advanced Practice Nurses
Pharmacists
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To discuss the diagnosis and assessment of neuropathic pain and survey recent research on pathophysiologic mechanisms
- To present evidence-based treatment recommendations for the pharmacologic management of chronic neuropathic pain that take into account clinical effectiveness, adverse effects, influence on quality of life, and cost

TARGET POPULATION

Patients with neuropathic pain

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis/Evaluation

1. Medical history, physical and neurological examination, laboratory studies, magnetic resonance imaging (MRI), electrophysiologic studies, biopsy
2. Assessment: stimulus-evoked versus spontaneous pain, abnormal sensations, pain intensity, psychological comorbidities, sleep disturbance, work-related issues, rehabilitative needs, social support system
3. Physical examination: response to stimuli, sensory deficits versus hyperalgesia, nonsensory neurological and musculoskeletal symptoms
4. Ancillary studies: nerve conduction velocity tests, electromyography, quantitative sensory testing, magnetic resonance imaging/functional magnetic resonance imaging, psychosocial factors

Pharmacological Treatment/Management

1. First-line medications
    - Gabapentin
    - 5% Lidocaine patch
    - Opioid analgesics: Controlled-release and short-acting
        - Oxycodone hydrochloride monotherapy or in combination with hydrocodone bitartrate and acetaminophen, aspirin, or ibuprofen
        - Morphine sulfate
        - Levorphanol tartrate
        - Transdermal fentanyl
        - Methadone hydrochloride
    - Tramadol hydrochloride
    - Tricyclic antidepressants, such as:
        - Amitriptyline
        - Nortriptyline
        - Desipramine hydrochloride
2. Second-line medications
    - Other anti-convulsant medications
        - Lamotrigine
        - Carbamazepine
        - Other second-generation anticonvulsants, such as: levetiracetam, oxcarbazepine, tiagabine, topiramate, zonisamide
    - Other antidepressant medications
        - Bupropion hydrochloride
        - Citalopram
        - Paroxetine
        - Venlafaxine hydrochloride
        - Imipramine hydrochloride
3. Beyond second-line medications include capsaicin, clonidine, dextromethorphan, mexiletine

MAJOR OUTCOMES CONSIDERED

- Clinical effectiveness, measured by pain relief
- Safety
- Adverse effects/Drug interactions
- Pain relief/Quality of life
- Cost

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

MEDLINE searches, examination of reference lists of published articles and book chapters, and personal knowledge of the literature were used to identify material relevant to developing treatment recommendations for patients with neuropathic pain. This material included systematic literature reviews, reports of randomized clinical trials, and publications discussing the development and evaluation of clinical guidelines.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus (Committee)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not stated

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Consensus Development Conference)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Members of the faculty of the Fourth International Conference on the Mechanisms and Treatment of Neuropathic Pain participated in a meeting supported by an unrestricted educational grant to the University of Rochester Office of Professional Education (Rochester, NY) and contributed as authors to the preparation of the recommendations.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

- Recommendations for first-line treatments are made with a high degree of confidence because they are consistent with the results of multiple randomized controlled trials and the clinical experience of the faculty.
- Recommendations for second-line treatments are made with moderate confidence that these treatments can be effective in individual circumstances when patients have not obtained adequate relief from first-line pharmacologic treatments alone and in combination.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Definitions for recommendations for first-line and second-line treatments are provided at the end of the "Major Recommendations" field.

Diagnosis and Assessment

The diagnosis of neuropathic pain is based on medical history, review of systems, physical and neurological examination, and appropriate laboratory studies including blood and serologic tests, magnetic resonance imaging, and electrophysiologic studies. In some instances, nerve or skin biopsy is necessary to directly visualize nerve fibers. Refer to the original guideline document for a detailed discussion.

First-line Medications

The efficacy of gabapentin, the 5% lidocaine patch, opioid analgesics, tramadol hydrochloride, and tricyclic antidepressants (TCAs) has been consistently demonstrated in multiple randomized controlled trials. Each one can be used as an initial treatment for neuropathic pain in certain clinical circumstances. Opioid analgesics and TCAs generally require greater caution than the other options. Treatment recommendations are summarized in Table 2 in the original guideline document.

- Gabapentin: To decrease adverse effects and increase patient adherence to treatment, gabapentin should be initiated at low dosages—100 to 300 mg in a single dose at bedtime or 100 to 300 mg 3 times daily—and then titrated every 1 to 7 days by 100 to 300 mg as tolerated. Although 3 times daily is the target dosage, more rapid titration may be accomplished if most of the daily dose is initially given at bedtime to limit daytime sedation. Target dosages that demonstrated benefits of gabapentin treatment for neuropathic pain ranged from 1,800 mg/d (the Federal Drug Administration [FDA]-approved dosage for post-herpetic neuralgia [PHN]) to 3,600 mg/d. If only partial relief of pain occurs at 1,800 mg/d, titration can be continued up to 3,600 mg/d (1,200 mg 3 times daily) as tolerated. The final dosage should be determined either by achieving complete pain relief or by the development of unacceptable adverse effects that do not resolve promptly. An adequate trial of gabapentin would include 3 to 8 weeks for titration to allow the development of tolerance to adverse effects, plus 1 to 2 weeks at the maximum tolerated dosage.
- 5% Lidocaine Patch: The 5% lidocaine patch is a topical preparation. In patients with normal hepatic function, blood levels of the drug are minimal, and accumulation does not occur with a dosage schedule of 12 hours on, 12 hours off. Treatment with the 5% lidocaine patch consists of the application of no more than 3 patches daily for a maximum of 12 hours, with the patch applied directly to the area of maximal pain (the FDA-approved dosage for post-herpetic neuralgia). Titration of the 5% lidocaine patch is not necessary, and an adequate trial would last 2 weeks.
- Opioid Analgesics: Numerous short- and long-acting opioid analgesics are available. The guideline developers hold diverse opinions regarding the algorithm for administering opioids for neuropathic pain. One recommended approach is to begin treatment with opioid analgesics using a short-acting medication at dosages equianalgesic to the oral administration of morphine sulfate at 5 to 15 mg every 4 hours as needed. Commonly used short-acting opioid analgesics include oxycodone alone and hydrocodone bitartrate and oxycodone in combination with acetaminophen, aspirin, or ibuprofen (a morphine elixir can be used with patients who have difficulty swallowing).

  After 1 to 2 weeks of treatment, the patient's total daily dosage of a short-acting opioid analgesic can be converted to an equianalgesic daily dosage of one of the long-acting opioid analgesics such as controlled-release morphine, controlled-release oxycodone, transdermal fentanyl, levorphanol, or methadone hydrochloride. Limited access to short-acting medication for breakthrough pain may be appropriate. Conversion of the patient's treatment regimen from short-acting to long-acting medication may require considerable dosage adjustment for 1 to 2 weeks. Once the patient is receiving a stable dosage of a long-acting medication, an adequate trial of an opioid analgesic requires 4 to 6 weeks to assess both pain and function. Pain reduction without

improvement in function indicates a need to consider modifying treatment. With careful titration and monitoring, there is no clear maximum dosage of opioid analgesics. However, evaluation by a pain specialist may be considered when morphine sulfate equianalgesic dosages exceeding 120 to 180 mg/d are contemplated. The benefits of levels higher than 180 mg/d in patients with neuropathic pain have not been established in double-blind trials.

Careful documentation and appropriate monitoring of treatment are important for the safe and effective use of opioid analgesics. Model guidelines for the use of controlled substances for the treatment of pain have been adopted by the Federation of State Medical Boards of the United States, and the US Drug Enforcement Administration has recognized that the use of opioid analgesics is appropriate for treating chronic pain.

- Tramadol: Tramadol is a norepinephrine and serotonin re-uptake inhibitor with a major metabolite that is a mu-opioid agonist. To decrease the likelihood of adverse effects and increase patient adherence to treatment, tramadol should be initiated at low dosages—50 mg once or twice daily— and then titrated every 3 to 7 days by 50 to 100 mg/d in divided doses as tolerated. The maximum dosage of tramadol hydrochloride is 100 mg 4 times daily (in patients older than 75 years, 300 mg/d in divided doses), and an adequate trial requires 4 weeks.
- Tricyclic Antidepressants (TCAs): Patients must understand that TCAs have an analgesic effect that has been demonstrated to be independent of their antidepressant effect. To decrease adverse effects and increase patient adherence to treatment, TCAs should be initiated at low dosages—10 to 25 mg in a single dose at bedtime—and then titrated every 3 to 7 days by 10 to 25 mg/d as tolerated. Although the analgesic effect of TCAs has been thought to occur at lower dosages than the antidepressant effect, there is no systematic evidence of this. However, some data are consistent with a dose-response relationship; TCAs should be titrated to dosages of 75 to 150 mg/d as tolerated. If a blood level of approximately 100 ng/mL of the active drug and its metabolite is not found at dosages of 100 to 150 mg, titration can be continued further with caution. Blood levels of 500 ng/mL or higher of the active drug and its metabolite are associated with toxicity, and for titration higher than 100 to 150 mg/d, blood levels should be monitored and an electrocardiogram performed. An adequate trial of a TCA would last 6 to 8 weeks with at least 1 to 2 weeks at the maximum tolerated dosage.

Selecting a First-line Medication

Medication acquisition costs vary greatly by geographic region, insurance plan, industry health plan contracts, and availability of pharmaceutical company programs for patients without drug benefit plans. Physicians should become as familiar as possible with the acquisition costs of the medications they prescribe and with the reimbursements provided by their patients' insurance plans. Doing so will not only benefit the finances of their patients but will also maximize adherence to treatment recommendations. Consideration should be given to the availability of generic versions of medications used in treating chronic neuropathic pain. Tramadol, TCAs, and some opioid analgesics are available in generic forms with acquisition costs considerably lower than the 2 first-line medications that are still protected by patent: gabapentin and the 5% lidocaine patch.

Refer to the original guideline document and the "Contraindications" field for information on other considerations for selecting first-line medications.

Sequential and Combination Treatment with First-line Medications

The percentage of patients with neuropathic pain who do not respond to one of these five first-line medications but who then obtain satisfactory pain relief from a different one is unknown. Even within a class of medication, some patients fail to respond to one medication but then respond to another. Current understanding of the pathophysiologic mechanisms of neuropathic pain is consistent with the existence of multiple pain mechanisms, each of which may respond differently to medications with different mechanisms of action. Therefore, there is both an empiric and theoretical basis for recommending that patients who do not respond to one of these five first-line medications be treated with another one.

It is common for patients to have a partial response to these medications, and combination treatment should be considered when this occurs. Despite the lack of controlled data, combinations of two or more of these first-line medications can be recommended when patients have a partial response to a single one or at the beginning of treatment, either to increase the likelihood of a beneficial response or when a medication that requires titration to reach an effective dosage is also being used. Disadvantages of combination therapy include an increased risk of adverse effects as the number of medications is increased and difficulty identifying which of several medications is responsible for the adverse effects.

Second-line Medications

When patients do not have a satisfactory response to treatment with the five first-line medications alone or in combination, several medications can be considered second-line. Because these second-line treatments are used less often by physicians and fewer trials have examined their efficacy, their use is not described in detail.

- Other Anticonvulsant Medications

  Lamotrigine is the one second-line pharmacologic treatment for which there is evidence of efficacy based on consistent results of multiple randomized controlled trials for human immunodeficiency virus (HIV) sensory neuropathy, painful diabetic neuropathy (PDN), and central poststroke pain, as well as in a subgroup of patients with incomplete spinal cord lesions in a trial of patients with pain from spinal cord injury. The guideline developers do not consider lamotrigine a first-line treatment for neuropathic pain because of the slow and careful titration required and the risk of both severe rash and Stevens-Johnson syndrome associated with its use.

  Carbamazepine has a well-established beneficial effect for trigeminal neuralgia and is approved by the FDA for the treatment of this neuropathic pain syndrome. In patients with painful diabetic neuropathy, some evidence exists for a beneficial effect of carbamazepine, but results from studies of phenytoin are inconsistent; these clinical trials were conducted more than 20 years ago and do not meet current methodological standards.

On the basis of clinical trials of anticonvulsants for chronic neuropathic pain, lamotrigine and carbamazepine can be recommended for patients who have not responded to an adequate trial of gabapentin when treatment with an anticonvulsant is sought.

- Other Antidepressant Medications: Results of clinical trials indicate that bupropion, citalopram, paroxetine, and venlafaxine can be recommended for patients who have not responded to an adequate trial of nortriptyline (or another TCA) when additional treatment with an antidepressant is being considered.

Beyond Second-line Medications

Other medications sometimes used for the treatment of patients with neuropathic pain include capsaicin, clonidine, dextromethorphan, and mexiletine. According to the clinical experience of the guideline developers and the inconsistent results of clinical trials, these medications may occasionally be effective in individual circumstances.

Definitions:

- Recommendations for first-line treatments are made with a high degree of confidence because they are consistent with the results of multiple randomized controlled trials and the clinical experience of the faculty.
- Recommendations for second-line treatments are made with moderate confidence that these treatments can be effective in individual circumstances when patients have not obtained adequate relief from first-line pharmacologic treatments alone and in combination.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Recommendations for first-line pharmacologic treatments are based on positive results from multiple randomized controlled trials, and recommendations for second-line pharmacologic treatments are based on the positive result of a single randomized controlled trial or inconsistent results of multiple randomized controlled trials (with 1 exception). Recommendations for "Beyond Second Line Medications" are based on the clinical experience of the guideline developers and the inconsistent results of clinical trials.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Effective and appropriate use of medication for the treatment/management of chronic neuropathic pain based on clinical effectiveness (significant pain reduction), minimal adverse effects, improvement in quality of life, and cost

POTENTIAL HARMS

Drug-related Adverse Effects

Drug-related adverse effects are common in the treatment of neuropathic pain, not only because of the specific medications used but also because many patients with this condition are older, take other medications, and have comorbid illnesses. Patients who require special dosage titration and monitoring include:

- individuals who are elderly
- patients with a history of substance abuse
- patients with depression
- patients with cardiovascular disease, hepatic insufficiency, or renal insufficiency
- patients taking medications that have the potential for interaction with neuropathic medications

Refer to the original guideline document for detailed discussion of the adverse effects associated with first-line and second-line medications.

CONTRAINDICATIONS

CONTRAINDICATIONS

Tricyclic antidepressants have numerous contraindications, especially in patients with cardiovascular disease, because of the risks of conduction defects, arrhythmias, tachycardia, stroke, and acute myocardial infarction.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

Five caveats are required before presenting the treatment recommendations:

- First, these recommendations may apply to complex regional pain syndrome type I, although controlled trials of first-line medications are lacking; this pain syndrome is believed to be due to nervous system dysfunction without permanent injury to a nerve trunk.
- Second, although chronic neuropathic back pain (i.e., cervical and lumbar radiculopathic pain) is probably the most prevalent pain syndrome to which neuropathic mechanisms contribute, there are no accepted diagnostic criteria for identifying this neuropathic component. It is likely that a combination of neuropathic, skeletal, and myofascial mechanisms account for this type of pain in many patients. Subgroup analyses of a randomized placebo-controlled trial suggested that patients who had chronic radicular low back pain

responded best to treatment with nortriptyline hydrochloride, one of the first-line medications.
- Third, distinct treatment guidelines for tic douloureux (trigeminal neuralgia) emphasize carbamazepine, phenytoin, and baclofen.
- Fourth, it is acknowledged that pharmacologic management is not a cure and should be considered an integral component of a more comprehensive approach to treatment. A discussion of the many widely used nonpharmacologic approaches including physical therapy, psychological treatments, invasive procedures (e.g., neural blockade or dorsal column stimulation), and various complementary and alternative medicine interventions is beyond the scope of this review.
- Fifth, it is assumed that pharmacotherapy will be used within a treatment context in which education, support, and reassurance characterize the relationship between the patient and physician. The guideline developers recommend that the dosage be adjusted as necessary based on frequent and careful evaluation of adverse effects, treatment adherence, and pain relief.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Dworkin RH, Backonja M, Rowbotham MC, Allen RR, Argoff CR, Bennett GJ, Bushnell MC, Farrar JT, Galer BS, Haythornthwaite JA, Hewitt DJ, Loeser JD, Max MB, Saltarelli M, Schmader KE, Stein C, Thompson D, Turk DC, Wallace MS, Watkins LR, Weinstein SM. Advances in neuropathic pain: diagnosis, mechanisms, and treatment recommendations. Arch Neurol 2003 Nov;60(11):1524-34. [70 references] PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2003 Nov

GUIDELINE DEVELOPER(S)

Fourth International Conference on the Mechanisms and Treatment of Neuropathic Pain - Independent Expert Panel

SOURCE(S) OF FUNDING

Endo Pharmaceuticals provided an unrestricted educational grant to the University of Rochester Office of Professional Education (Rochester, NY) to support a meeting on the treatment of neuropathic pain, and all authors except for Dr Max received an honorarium for participation in the meeting from the University of Rochester.

GUIDELINE COMMITTEE

Not stated

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Authors: Robert H. Dworkin, PhD, Department of Anesthesiology, University of Rochester, NY; Miroslav Backonja, MD, Department of Neurology, University of Wisconsin, Madison; Michael C. Rowbotham, MD, Department of Neurology, University of California, San Francisco; Robert R. Allen, MD, AstraZeneca, Wilmington, DE; Charles R. Argoff, MD, Department of Neurology, North Shore University Hospital, Manhasset, NY; Gary J. Bennett, PhD, Department of Anesthesiology, McGill University, Montreal, Quebec; M. Catherine Bushnell, PhD, Department of Anesthesiology, McGill University, Montreal, Quebec; John T. Farrar, MD, Department of Neurology, University of Pennsylvania, Philadelphia; Bradley S. Galer, MD, Endo Pharmaceuticals, Chadds Ford, PA; Jennifer A. Haythornthwaite, PhD, Department of Psychiatry, Johns Hopkins University, Baltimore, MD; David J. Hewitt, MD, Ortho-McNeil Pharmaceutical, Raritan, NJ; John D. Loeser, MD, Department of Neurosurgery, University of Washington, Seattle; Mitchell B. Max, MD, Pain and Neurosensory Mechanisms Branch, National Institute of Dental and Craniofacial Research, Department of Health and Human Services, Bethesda, MD; Mario Saltarelli, MD, PhD, Pfizer, Groton, CT; Kenneth E. Schmader, MD, Department of Medicine and Geriatric Research, Education, and Clinical Center, Duke University and Durham VA Medical Centers, Durham, NC; Christoph Stein, MD, Department of Anesthesiology, Freie Universitat Berlin, Berlin, Germany; David Thompson, PhD, Innovus Research Inc, Medford, MA; Dennis C. Turk, PhD, Department of Anesthesiology, University of Washington, Seattle; Mark S. Wallace, MD, Department of Anesthesiology, University of California, San Diego; Linda R. Watkins, PhD, Department of Psychology, University of Colorado, Boulder; Sharon M. Weinstein, MD, Department of Anesthesiology, University of Utah, Salt Lake City

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

- Dr Dworkin has received research support, consulting fees, or speakers bureau honoraria in the past year from Abbott Laboratories, Allergan, AstraZeneca, Bristol-Myers Squibb, Elan Pharmaceuticals, Eli Lilly and Co, Endo Pharmaceuticals, King Pharmaceuticals, Johnson and Johnson, NeurogesX, Novartis Pharmaceuticals, Ortho-McNeil Pharmaceutical, Pfizer, Purdue Pharma, Quigley Pharma, Reliant Pharmaceuticals, and UCB Pharma.
- Dr Rowbotham has been affiliated with or had financial involvement with Abbott Laboratories, Allergan, Bayer, Biogen, Blue Shield/United Behavioral Health, Elan, Endo Pharmaceuticals, Fulcrum Pharma, Grunenthal GMBH, Hind Health Care, Lineberry Research Associates, NeuroMed Technologies, Ortho-McNeil/Johnson and Johnson Pharmaceutical Research Institute, Pain Management Research LLC/Teikoku Pharma USA, Pfizer, Schwarz Biosciences, and WinPharm Associates.
- Dr Farrar has received research or grant support from Pfizer, Cephalon, Smithkline Beecham, Knoll, and Searle; served as a consultant for Abbott Laboratories, Alza, Endo Pharmaceuticals, UCB Pharma, and Faulding; and served on the speakers bureau of Purdue Frederick.
- Dr Galer has been an employee of and has stock options in Endo Pharmaceuticals and has received royalty payments from Hind Health Care.
- Dr Max has participated in ongoing scientific collaborations or relevant discussions with Johnson and Johnson, Purdue Pharma, and Merck; has had employment conversations with Abbott Laboratories; and has served as a paid consultant for Pfizer, Abbott Laboratories, Endo Pharmaceuticals, AstraZeneca, Bristol-Myers Squibb, Eli Lilly, Bayer, Elan, Novartis, Watson Laboratories, and Wyeth-Ayerst.

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Not available at this time.

Print copies: Available from Robert H. Dworkin, PhD, Department of Anesthesiology, University of Rochester School of Medicine and Dentistry, 601 Elmwood Avenue, Box 604, Rochester, NY 14642; Email: robert_dworkin@urmc.rochester.edu.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on May 4, 2004. The information was verified by the guideline developer on May 20, 2004.

COPYRIGHT STATEMENT

Date Modified: 11/15/2004